

# **ENTERPRISE PROJECT MANAGEMENT FRAMEWORK**

Prepared For

**COMMONWEALTH EXECUTIVE CABINETS**

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## 1. BACKGROUND

The Commonwealth Office of Technology (COT) was created as an agency of the Commonwealth of Kentucky within the Finance and Administration Cabinet. COT has been designated as the lead organizational entity within the Executive Branch regarding delivery of information technology services, including application development and delivery, and serves as the single information technology authority for the Commonwealth.

COT is headed by an Executive Director and also serves as the Chief Information Officer (CIO) of all agencies with the Executive Branch of the Commonwealth of Kentucky.

Pursuant to an House Bill 244 (HB244), which is available in Appendix 2.1, relating to reorganization enacted by the General Assembly of the Commonwealth, COT has been organized into five offices. The Office of Project Management (OPM) is one of those offices within COT and is responsible for overseeing large and/or critical information technology projects across the Executive Branch with the goal of mitigating risk while averting avoidable delays that could lead to increased spending.

## 2. PURPOSE & OBJECTIVES

### 2.1. Purpose

Project Management is a professional discipline performed by a community of project management professionals throughout the Commonwealth working to ensure successful delivery of projects so that the benefits each project was designed to provide to the citizens of the Commonwealth can be realized.

This Enterprise Project Management Framework establishes the basic conceptual structure for managing projects across the Commonwealth of Kentucky. These structures span the entire project lifecycle and include the following organizational governance concepts:

- Program Management
- Project Management
- Portfolio Management
- Product Management
- Organizational Change Management
- Risk Management
- Strategic Planning

As such, the term “project management” may apply to any or all of these governance concepts, as they relate to projects. Program, project and portfolio management are governance concepts owned by OPM. Product management, organizational change management, risk management and strategic planning are governance concepts for which OPM provides guidance related to projects, but each has a broader context for the organization beyond OPM’s purpose.

This Framework will be supported by policies defining specific standards, processes, tools and best practices. While the Framework will change slowly over time, OPM will regularly publish, review and update policies to provide project managers throughout the Commonwealth with clear and current expectations for managing projects. This Framework and supporting policies apply to all projects.

This Framework and supporting policies are intended to establish minimum baseline requirements for project oversight. Additional rigor can and should be applied when deemed appropriate by individual project teams.

All Executive Branch cabinets and agencies are in scope for this Framework except:

- Agencies led by a statewide elected official
- The nine (9) public institutions of postsecondary education
- The Department of Education's services provided to local school districts
- The Kentucky Retirement Systems and the Teachers' Retirement System
- The Kentucky Housing Corporation
- The Kentucky Lottery Corporation
- The Kentucky Higher Education Student Loan Corporation
- The Kentucky Higher Education Assistance Authority

## **2.2. Objectives**

The Commonwealth undertakes projects of various size, risk and complexity so this Framework embraces a variety of approaches to project management. The Framework is intended to provide "loose" guidance and structure while supporting policies will be issued to define specific standards, processes, tools and best practices. This Framework and supporting policies have the following objectives:

- Supporting successful project outcomes in terms of sponsor satisfaction, fiscal performance and delivery timeframe
- Transparent reporting of relevant, actionable information to various stakeholders such as the project team, project leadership, agency leadership and executive leadership
- Focusing projects on delivering value to the Commonwealth such as by aligning projects with strategic plans
- Enabling project teams to select the approaches to project management appropriate for their organizational culture and project characteristics
- Establishing appropriate project management rigor for each project without overly burdening project teams
- Addressing all aspects of the project lifecycle from concept to closeout
- Efficient utilization of project resources
- Supporting collaboration within the community of project management professionals within the Commonwealth

### 3. GOVERNANCE CONCEPTS

#### 3.1. Project Management

As per the Project Management Body of Knowledge (PMBok) published by the Project Management Institute (PMI), a **project** is “a temporary endeavor undertaken to create a unique product, service, or result.” Projects end when their intended objectives have been reached or the project has been terminated.

Project management is the professional discipline of applying knowledge, skills, tools and techniques to manage a project from conception through delivery of defined outcomes, such as an application, event, product or service. Project management enables organizations to execute projects effectively and efficiently and helps organizations:

- Realize business objectives
- Reduce and manage risk
- Be more predictable
- Resolve problems and issues
- Optimize the use of organizational resources
- Manage change

#### 3.2. Program Management

According to PMI, a program is “a group of related projects and/or sub-programs managed in a coordinated manner to obtain benefits not available from managing them individually.”

Programs often:

- Have strategic business objectives that are transformational in nature
- Cross organizational boundaries
- Have significant dependencies across projects

Program management is the professional discipline of applying knowledge, skill, tools and techniques to obtain benefits and outcomes not available by managing program components individually. The benefits of program management to an organization mirror the benefits of project management, but the activities of program management differ in scale and have a greater focus on managing the interrelated impact of dependencies, issues, risks, resources, etc. across projects to provide a holistic view of program health.

#### 3.3. Portfolio Management

According to PMI, a portfolio is defined as “projects, programs, subsidiary portfolios and operations managed in a coordinated manner to achieve strategic objectives.”

The scope of each portfolio is defined by the organization using any number of criteria such as alignment with business units, funding sources, strategic initiatives, etc. The portfolio components may not necessarily be interdependent or have related objectives. Portfolio components can be measured, ranked and prioritized and may include both “pipeline” and active components.

Portfolio management is the professional discipline of applying knowledge, skill, tools and techniques to centrally manage one or more portfolios to achieve strategic objectives. Portfolio management is intended to:

- Guide organizational investment decisions
- Align allocation of resources with strategic objectives
- Provide decision-making transparency

As per standards published by the PMI, the following is the high level comparison of project, program and portfolio management.

Project Management	Program Management	Portfolio Management
A project is a single undertaking	A group of related projects, subprograms and program activities that are managed in a way to obtain benefits not available from managing them individually	A group of all the <b>projects, programs and operations</b> an organization is running
Consists of a series of tasks that aims to produce a specific product, service, or benefit within a defined timeline	Each project within the program assists in meeting goals	It could be every project across the entire company, a division, or a department
Project Management is all about <b><i>“executing projects right”</i></b>	Program Management is all about <b><i>“managing dependencies”</i></b>	Portfolio Management is all about <b><i>“executing the right projects”</i></b>
<b>Tactical</b> in nature- A Project Manager's primary focus is facilitating a project to completion	<b>Tactical</b> in nature- A Program Manager's primary focus is being an integrator	<b>Strategic</b> in nature- A Portfolio Manager's primary focus is overseeing projects in which an organization has invested its resources to achieve its business goals

### 3.4. Product Management

Product management relates to project management in that products typically mature via a series of projects and thus the product lifecycle is a common source of project concepts. The lifecycle for a product extends beyond individual projects. Effective project management must align with the lifecycle for each product associated with a project, especially in terms of delivering value to the product's users.

### **3.5. Organizational Change Management**

Prosci defines Organization Change Management as the “discipline that guides how we prepare, equip and support individuals to successfully adopt change in order to drive organizational success and outcomes.”

By definition, projects are intended to produce a change and in most cases, this change impacts individuals. As such, effective project management must encompass not only technical changes, but ensure scope includes the effort needed for humans to adopt the changes implemented via the project.

### **3.6. Risk Management**

The Association for Project Management defines risk management as a “process that allows individual risk events and overall risk to be understood and managed proactively, optimizing success by minimizing threats and maximizing opportunities.”

Projects risks:

- Are a subset of organizational risk
- Must be managed as part of the project
- May feed a broader organizational risk management program

### **3.7. Strategic Planning**

Aligning projects with strategic plans is central to portfolio management. In addition, all phases of the project lifecycle must consider alignment with strategic plans. The following are examples of when strategic plans may influence decisions made throughout the project lifecycle:

- Drawing lines between items in or out of scope
- Quantifying risks
- Resolving issues
- Deciding to accept or reject change requests
- Revisiting project objectives with project leadership when strategic direction changes
- Defining acceptance criteria for project deliverables



## 4. PROJECT MANAGEMENT FRAMEWORKS

The Executive Branch consists of a number of organizations with widely varying functions. Each entity has a unique culture driven by the nature of the services they provide. Project management frameworks, methodologies, tools and practices must align with the organization's culture in order to be effectively integrated within the organization's processes.

The following project management frameworks are recognized for use across the Commonwealth with the intent of allowing organizations and project teams to select the framework that will position their unique project for success:

- Waterfall
- Scrum
- Kanban
- Hybrid

Agile is not identified as a Framework as Agile is a mindset. Agile is a way of thinking and acting based on four values and 12 principles as defined in the [Manifesto for Agile Software Development](#). Various frameworks, methodologies, tools and practices have evolved based upon Agile values and principles. Some of the widely adopted and proven frameworks are recommended in this documented, as per following sub-sections.

Each framework is described below. Detailed standards, processes, tools and best practices for implementing each framework across different categories of projects will be defined in policies supporting this Framework.

### 4.1. Project Lifecycle

To establish a common frame of reference across each methodology, the Commonwealth recognizes the following five high-level phases of the project lifecycle.

- a. Requesting
- b. Initiation
- c. Planning
- d. Execution(\*)
- e. Closing

**According to PMBOK- “A project life cycle is the series of phases that a project passes through from its start to its completion. A project phase is a collection of logically related project activities that culminates in the completion of one or more deliverables. The phases can be sequential, iterative or overlapping.”**

(\*) Execution includes Monitoring and Control

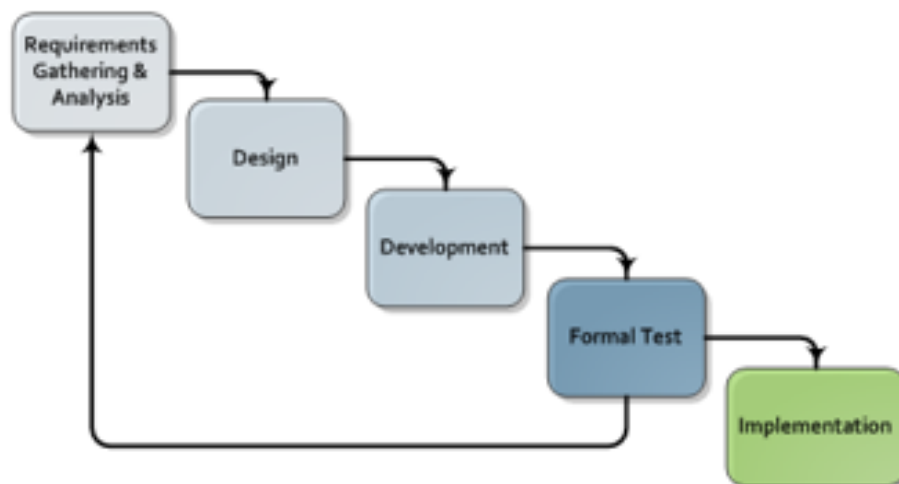
A high level description of each of the Project Life Cycle phases is provided in following table.

Phase	Key Characteristics	Typical Outcomes
<b>Requesting</b>	<ul style="list-style-type: none"> <li>• Project concepts are identified and refined</li> <li>• Captures specific project information that will aide in project evaluation</li> <li>• Review, prioritization and approval processes</li> </ul>	<ul style="list-style-type: none"> <li>• Prioritized project</li> </ul>
<b>Initiation</b>	<ul style="list-style-type: none"> <li>• Defines the preliminary project cost, scope, roles, and timeline</li> <li>• Formalizes the existence of the project</li> </ul>	<ul style="list-style-type: none"> <li>• Project charter</li> <li>• Approval to advance to the planning phase</li> </ul>

Phase	Key Characteristics	Typical Outcomes
		<ul style="list-style-type: none"> <li>Memorandum of Agreement (MOA), as needed for cross agency projects</li> <li>Statement of Work (SOW), if applicable</li> <li>Proof of concept, if applicable</li> </ul>
<b>Planning</b>	<ul style="list-style-type: none"> <li>Defines the detailed project schedule, budget, resources, communication, risk timeline</li> <li>Provides the baseline to control and manage the project</li> </ul>	<ul style="list-style-type: none"> <li>Detailed project plan</li> <li>Backlog of user stories</li> <li>Approval to begin project execution</li> </ul>
<b>Execution</b>	<ul style="list-style-type: none"> <li>Executes the project plan</li> <li>Delivers regular updates to stakeholders detailing progress</li> <li>Relies on the plans from the Planning Phase to control the project</li> </ul>	<ul style="list-style-type: none"> <li>Deliver the end product or service</li> <li>Acceptance of deliverables</li> <li>Approval to close the project</li> </ul>
<b>Closing</b>	<ul style="list-style-type: none"> <li>Concludes all project activities</li> <li>Administratively closes the project</li> <li>Turns the delivered product or service over to customer or a support group</li> <li>Assesses project outcomes and team performance</li> </ul>	<ul style="list-style-type: none"> <li>Best practices and lessons learned documented</li> <li>Project closure documentation</li> <li>Transition to support group</li> </ul>

## 4.2. Waterfall Framework

Waterfall, sometimes referred to as “Traditional” project management, requires that each activity in a sequence must be completed and signed-off before the next one begins. For typical IT projects, this comprises of activities or phases as depicted in the figure below. A waterfall approach does not require only a single iteration or phase per project, but does encourage projects to be performed via multiple iterations, or phases.



#### 4.2.1. Typical Deliverables in Waterfall Stages

Phase	Typical Deliverables
<b>Requirement Gathering</b>	<ul style="list-style-type: none"> <li>• Project Requirements Document (PRD)</li> <li>• Requirements Traceability Matrix (RTM)</li> <li>• Risk Management Plan</li> <li>• Quality Assurance Plan (Draft)</li> <li>• Test Plan (Draft)</li> <li>• System Security Document</li> </ul>
<b>Design</b>	<ul style="list-style-type: none"> <li>• System Architecture Document</li> <li>• Technical Specifications</li> <li>• Data Migration and/or Conversion Plan (Draft)</li> <li>• Conceptual and Logical Database Models (Draft)</li> <li>• Maintenance and Operations Manual (Draft)</li> <li>• Test Plan (Draft)</li> <li>• Implementation Plan (Draft)</li> </ul>
<b>Development</b>	<ul style="list-style-type: none"> <li>• Deployable System Software Packages</li> <li>• System Architecture Document (Revised)</li> <li>• Technical Specifications (Revised)</li> <li>• User Documentation</li> <li>• Configuration Management Plan</li> <li>• Operations and Maintenance Manual (Revised)</li> <li>• Implementation Plan (Revised)</li> <li>• Transition Plan</li> <li>• Release Notes</li> </ul>
<b>Testing</b>	<ul style="list-style-type: none"> <li>• Quality Assurance Plan</li> <li>• Test Strategy and Test Plan</li> <li>• Test scenarios and detailed test cases with data grids where applicable</li> <li>• Quality Reports and Metrics</li> <li>• Requirements Traceability for Test Coverage</li> </ul>
<b>Implementation</b>	<ul style="list-style-type: none"> <li>• Operational System</li> <li>• User Documentation</li> <li>• Training Material</li> <li>• Operations and Maintenance Manual</li> </ul>

#### 4.2.2. Typical KPIs for Waterfall Projects

Typical KPI	Description
<b>Project Health Indicator</b>	Overall health indicator (red, yellow, green) of the project, with individual indicators for scope, schedule and budget.
<b>Risk Indicator</b>	<ul style="list-style-type: none"> <li>• Overall risk matrix comprising all open risks with impact and probability information</li> <li>• Time period trend of open and closed risks giving trending/historic information</li> <li>• Indicators for risks (red, yellow, green) to provide information on risk categories</li> </ul>

Typical KPI	Description
<b>Defect Metrics and Trend</b>	<ul style="list-style-type: none"> <li>Defect metrics and trend during execution phase giving open and trending defects with respect to:               <ul style="list-style-type: none"> <li>Criticality –critical, high, medium, low</li> <li>Priority</li> <li>Severity</li> </ul> </li> <li>Indicators for risks (red, yellow, green) to provide information on risk categories</li> </ul>
<b>Executive Escalation</b>	<ul style="list-style-type: none"> <li>Specific escalation to steering committee for intervention and resolution</li> </ul>

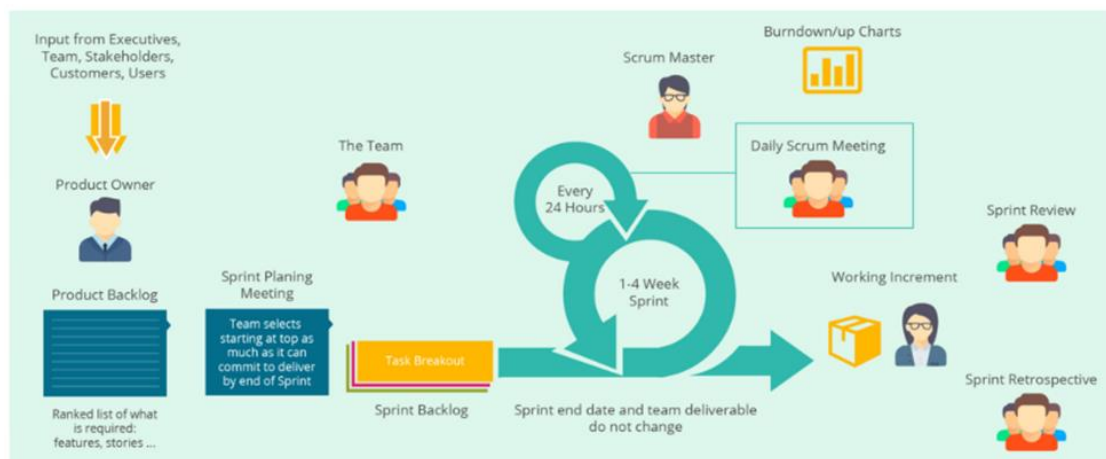
### 4.3. SCRUM FRAMEWORK

Scrum is a framework for effective team collaboration on complex products. Scrum embraces Agile values and principles and is founded on empiricism, which asserts that knowledge comes from experience and making decisions based on what is known.

Scrum employs an iterative, incremental approach to optimize predictability and control risk. Three pillars uphold every implementation of empirical process control:

- Transparency
- Inspection
- Adaptation

A high level overview of the Scrum process is depicted in the below workflow. More details can be found at the publicly available [Scrum Guide](#).



Scrum is recommended where time to market is a crucial factor and frequent incremental releases are needed to get early user feedback. A few examples of the types of projects where Scrum is recommended are:

- Implementation of new applications, product, services based on new technologies
- Frequent releases of new features, enhancements in existing systems- as frequently as many times per day
- Develop and maintain various operational environments

### 4.3.1. Typical Deliverables in Scrum Framework

Phase	Key Characteristics	Typical Deliverables
<b>Requesting</b>	<ul style="list-style-type: none"> <li>IT request received</li> <li>Business Analyst (BA) assigned for discovery               <ul style="list-style-type: none"> <li>Discovery document</li> <li>Business case document</li> </ul> </li> <li>Create project request for approval</li> <li>Advance to the initiation phase (or defers the request)</li> </ul>	<ul style="list-style-type: none"> <li>Completed and approved project requests</li> </ul>
<b>Initiation</b>	<ul style="list-style-type: none"> <li>Defines the preliminary project cost, scope, roles, and timeline</li> <li>Formalizes the existence of the project</li> </ul>	<ul style="list-style-type: none"> <li>Project charter</li> <li>Approval to move to the planning phase</li> </ul>
<b>Planning</b>	<ul style="list-style-type: none"> <li>Create sprint 0 (if required) for               <ul style="list-style-type: none"> <li>Architecture readiness &amp; review</li> <li>Sprint 0 plan- estimates, tasks and assignments</li> <li>Initial product backlog sufficient enough to plan for at least first two development sprint cycles</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Sprint 0 Plan</li> <li>System/ security architecture document(s)</li> <li>Initial product backlog</li> <li>Approval to move to development sprints</li> </ul>
<b>Execution</b>	<ul style="list-style-type: none"> <li>Ongoing development/ sprint cycles- sprint planning, daily scrum meeting sprint reviews/ demos, sprint retrospective</li> <li>Backlog grooming</li> <li>Continuous integration/ continuous delivery</li> </ul>	<ul style="list-style-type: none"> <li>Configuration management plan</li> <li>Incremental product releases/ delivery</li> <li>Ongoing analysis, inspection, adaption</li> <li>Ongoing product backlog and sprint backlog refinement</li> <li>Project artifacts such system architecture, security plan, test strategy, test plan, deployment plan</li> </ul>
<b>Closing</b>	<ul style="list-style-type: none"> <li>Concludes all project activities</li> <li>Administratively closes the project</li> <li>Turns the delivered product or service over to customer or a support group</li> <li>Assesses project outcomes and team performance</li> </ul>	<ul style="list-style-type: none"> <li>Best practices and lessons learned documented</li> </ul>

### 4.3.2. Typical KPIs in Scrum Framework

Typical KPI	Description/Parameter	Remarks
<b>Project Performance Score Card</b>	<p>A Project Performance Score Card related to:</p> <ul style="list-style-type: none"> <li>• Product <ul style="list-style-type: none"> <li>○ Business value delivered</li> <li>○ Remaining feature backlog</li> <li>○ Quality</li> </ul> </li> <li>• Team <ul style="list-style-type: none"> <li>○ Customer and team satisfaction</li> <li>○ Iteration/sprint velocity variation</li> <li>○ Audit pass rate</li> </ul> </li> <li>• Financials <ul style="list-style-type: none"> <li>○ Cost savings per release</li> <li>○ Amount spent per release</li> </ul> </li> <li>• Schedule <ul style="list-style-type: none"> <li>○ Earned value</li> <li>○ Release burn down</li> <li>○ Days per release</li> </ul> </li> </ul>	To be provided every quarter or upon completion of development, whichever is shorter
<b>Sprint Burn down Chart/ Release Burn down Chart</b>	A chart showing the amount of work remaining at the end of each sprint- on going basis	<p>Updated chart at the end of every sprint/release and showing historical information on sprint/release wise work remaining vis-a vis work planned.</p> <p>For projects having complex features such as epics, epic burn down charts serve a similar purpose to a sprint/ release burn down chart</p>
<b>Cumulative Flow Chart</b>	<p>A cumulative chart showing historic trend at the end of each sprint/release comprising</p> <ul style="list-style-type: none"> <li>• Items/ features completed</li> <li>• Items/ features in progress</li> <li>• Items/ features in backlog (not started)</li> </ul>	Updated chart at the end of every sprint/release
<b>Leading Indicators</b>	<p>Leading Indicators</p> <ul style="list-style-type: none"> <li>• Amount of ready backlog</li> <li>• % of deviation in velocity from mean velocity</li> <li>• Outstanding defects</li> <li>• Blockers</li> </ul>	
<b>Executive Escalation</b>	Specific escalation to steering committee for intervention and resolution	

#### 4.4. Kanban Framework

KANBAN - began as a Japanese manufacturing system, but is now commonly used by technology teams. Central to the definition of Kanban is the concept of "flow" and the ability of team members to pull the next increment of work when they have capacity. The visual status a Kanban board provides is core to communication for Kanban teams.

At high level, Kanban consists of:

- Visualizing the workflow by:
  - Splitting the work into pieces, writing each item on a card and putting on the wall (physical or virtual)
  - Using named columns to illustrate where each item is in the workflow;
- Limiting Work In Progress (WIP) which is assigning explicit limits to how many items may be in progress at each workflow state

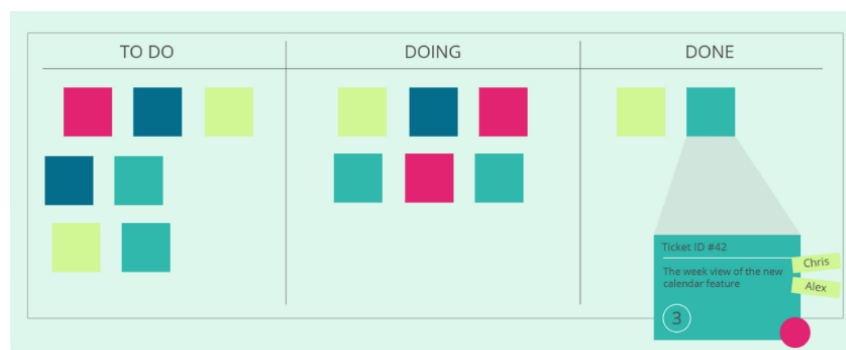
In Kanban, the team defines the stages of the workflow, then setup a way to move each task from one stage to the other. The Kanban system can be as flexible as the team decides, however, there are four pillars of Kanban philosophy that must be adhered to. These include:

Kanban Principle	Description
<b>Visual Card</b>	Each task has a card that includes all relevant info about it; this makes sure everything to complete the tasks is always at hand.
<b>Work In Progress (WIP) Limit</b>	Limit how many cards are in play at once; this prevents teams from over-committing.
<b>Continuous Flow</b>	The list of backlogs is moved down the list in order of importance to ensure that something is always being worked upon without any interruption.
<b>Kaizen</b>	Kaizen means continuous improvement by analyzing the current efficiency and improving the same continuously.

KANBAN is recommended if continuous workflow/output in a slow and steady stream of deliverables is required, such is typical for the following:

- Production support
- Business intelligence/ report development
- User Experience (UX) design
- Patch releases

The below figure represents a typical Kanban visual card layout.



#### 4.4.1 Typical Deliverables in Kanban Framework

Phase	Key Characteristics	Typical Deliverables
<b>Requesting</b>	<ul style="list-style-type: none"> <li>IT request received</li> <li>Business Analyst (BA) assigned for discovery               <ul style="list-style-type: none"> <li>Discovery document</li> <li>Business case document</li> </ul> </li> <li>Create project request for approval</li> <li>Advance to the initiation phase (or deferment of the request)</li> </ul>	<ul style="list-style-type: none"> <li>Completed and approved project requests</li> </ul>
<b>Initiation</b>	<ul style="list-style-type: none"> <li>Defines the preliminary project cost, scope, roles, and timeline</li> <li>Formalizes the existence of the project</li> </ul>	<ul style="list-style-type: none"> <li>Project charter</li> <li>Approval to advance to the planning phase</li> </ul>
<b>Planning</b>	<ul style="list-style-type: none"> <li>Conduct impact analysis (if required)</li> <li>Create product backlog</li> <li>Define Work In Progress (WIP) limit</li> <li>Define cycle time/ lead time</li> </ul>	<ul style="list-style-type: none"> <li>Initial product backlog</li> <li>System/ security architecture document</li> <li>Configuration management plan</li> <li>Risk management plan</li> <li>Approval to advance to development sprints</li> </ul>
<b>Execution</b>	<ul style="list-style-type: none"> <li>Ongoing task execution using Kanban board and pull system               <ul style="list-style-type: none"> <li>Impact analysis</li> <li>Development</li> <li>Build</li> <li>User acceptance test</li> <li>Release</li> <li>Required documentation</li> </ul> </li> <li>Track and monitor workflow, WIP</li> </ul>	<ul style="list-style-type: none"> <li>Ongoing feature/ product releases/ delivery</li> <li>Ongoing analysis, inspection, adaption</li> <li>Project artifacts- requirement , system architecture, security architecture, test strategy, test plan, integration and deployment plan</li> </ul>
<b>Closing</b>	<ul style="list-style-type: none"> <li>Concludes all project activities</li> <li>Administratively closes the project</li> <li>Turns the delivered product or service over to customer or a support group</li> <li>Assesses project outcomes and team performance</li> </ul>	<ul style="list-style-type: none"> <li>Best practices and lessons learned documented</li> </ul>

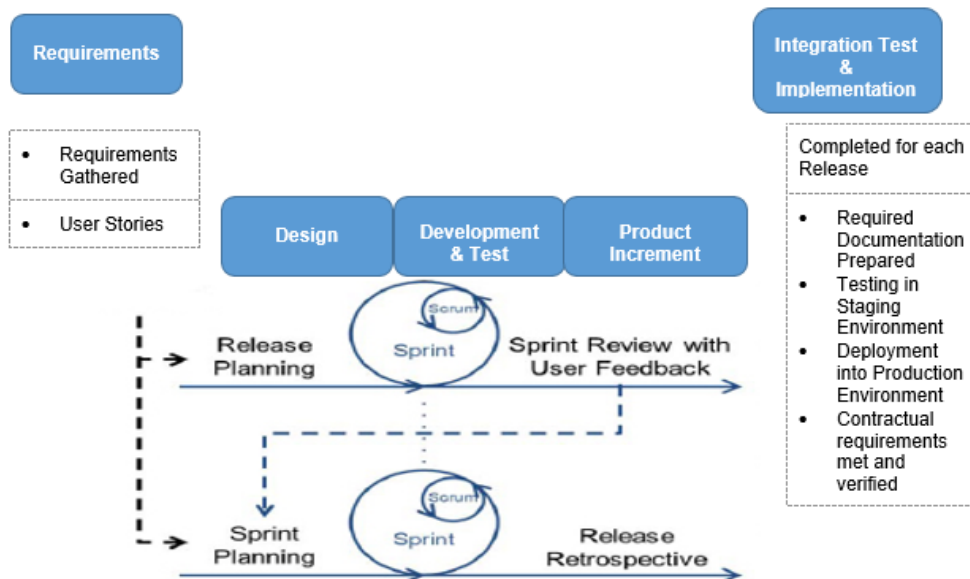


#### 4.4.2 Typical KPIs in Kanban Framework

Typical KPIs	Description/Parameter	Remarks
<b>Cumulative Flow Chart</b>	<ul style="list-style-type: none"> <li>A cumulative chart is time-based plot of the cards as they move from the left to the right on a Kanban board</li> <li>Cumulative flow chart provides information on               <ul style="list-style-type: none"> <li>Lead time/ cycle time trend</li> <li>Work In Progress (WIP)</li> </ul> </li> </ul>	Updated chart for bi-weekly review
<b>Other Charts</b>	<ul style="list-style-type: none"> <li>Cycle time control chart</li> <li>Cycle time distribution chart</li> <li>Average cycle time chart</li> <li>Flow efficiency chart</li> <li>Throughput (velocity) chart</li> </ul>	Monthly updated charts
<b>Executive Escalation</b>	<ul style="list-style-type: none"> <li>Specific escalation to the steering committee for intervention and resolution</li> </ul>	

#### 4.5. Hybrid Framework

A hybrid approach, a combination of Waterfall and Agile approaches, aims at getting the best of both approaches. Hybrid approaches are common and allow organizations and project teams to select the processes from various frameworks that best align with their processes and culture. The following is one example of a hybrid approach, but not the only approach.



The first level supports Waterfall development processes and is designed to meet all business requirements. These requirements are only met for each release (not for each sprint). The requirements and integration and test phases occur at cycle times larger than conventional Scrum. At the second level, Agile methods are used for the design and development stages of the Waterfall methodology and occur in a separate Agile development environment. The Integration Test Implementation phase occurs in a defined cycle time period, typically on a quarterly release cadence.

#### 4.5.1. Typical Deliverables in Hybrid Framework

Phase	Key Characteristics	Typical Deliverables
<b>Requesting</b>	<ul style="list-style-type: none"> <li>IT request received</li> <li>Business Analyst (BA) assigned for discovery               <ul style="list-style-type: none"> <li>Discovery document</li> <li>Business case document</li> </ul> </li> <li>Create project request for approval</li> <li>Advance to the initiation phase (or defers the request)</li> </ul>	<ul style="list-style-type: none"> <li>Completed and approved project requests</li> </ul>
<b>Initiation</b>	<ul style="list-style-type: none"> <li>Defines the preliminary project cost, scope, roles, and timeline</li> <li>Formalizes the existence of the project</li> </ul>	<ul style="list-style-type: none"> <li>Project charter</li> <li>Approval to advance to the planning phase</li> </ul>
<b>Planning</b>	<ul style="list-style-type: none"> <li>Create Sprint 0 (if required) for               <ul style="list-style-type: none"> <li>Architecture readiness &amp; review</li> <li>Sprint 0 plan- estimates, tasks and assignments</li> <li>Initial product backlog sufficient enough to plan for at least first two development sprint cycles</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Sprint 0 plan</li> <li>Initial product backlog</li> <li>Risk management plan</li> <li>Quality assurance plan</li> <li>Configuration management plan</li> <li>Approval to advance to development sprints</li> </ul>
<b>Execution</b>	<ul style="list-style-type: none"> <li>Ongoing development/ sprint cycles- sprint planning, daily scrum meeting sprint reviews/ demos, sprint retrospective</li> <li>Backlog grooming</li> <li>Continuous integration/ continuous delivery</li> <li>Integration testing</li> <li>Verification in pre-production and production environment</li> </ul>	<ul style="list-style-type: none"> <li>Incremental product releases/ delivery</li> <li>Ongoing analysis, inspection, adaption</li> <li>Ongoing product backlog and sprint backlog refinement</li> <li>Integration test plan</li> <li>Operations and maintenance manual</li> <li>Release and deployment plan</li> <li>Release report</li> <li>Operational system</li> <li>User documentation</li> <li>Training material</li> </ul>

Phase	Key Characteristics	Typical Deliverables
<b>Closing</b>	<ul style="list-style-type: none"> <li>Concludes all project activities</li> <li>Administratively closes the project</li> <li>Turns the delivered product or service over to customer or a support group</li> <li>Assesses project outcomes and team performance</li> </ul>	Best practices and lessons learned documented

#### 4.5.2. Typical KPI in Hybrid Framework

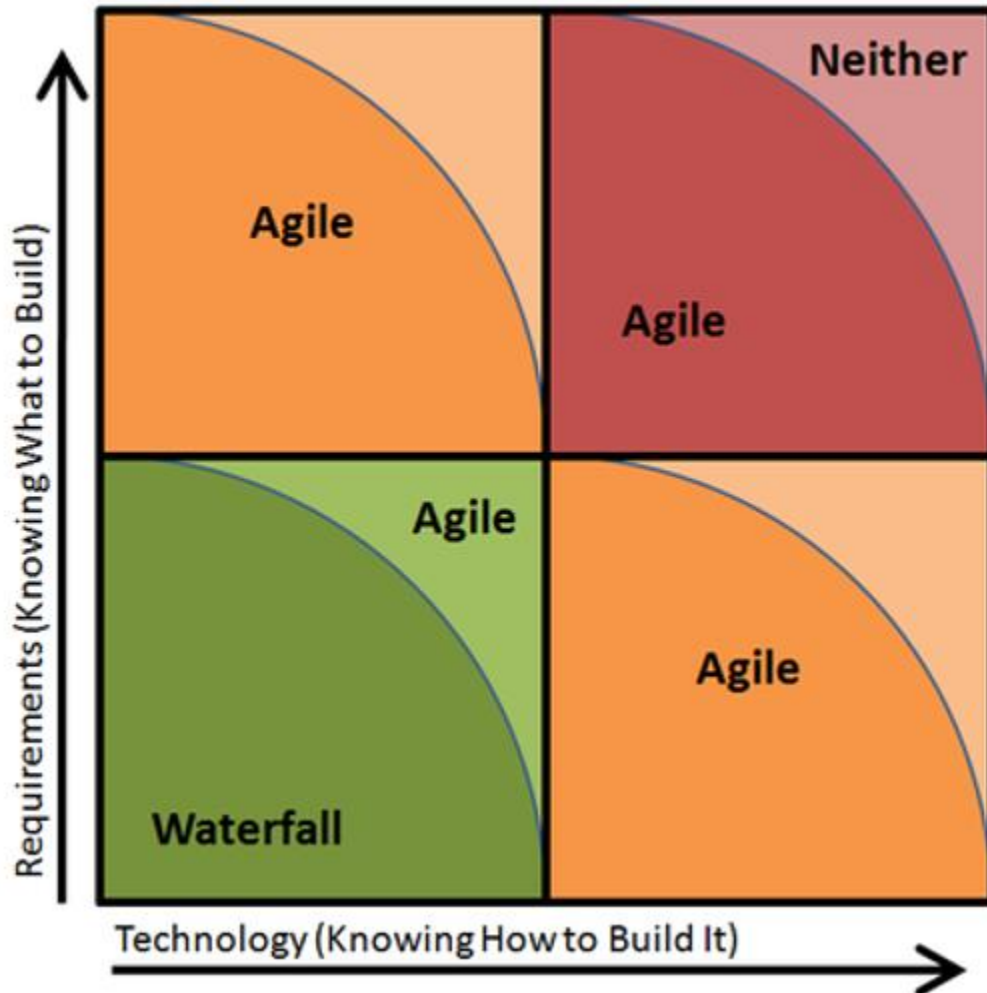
Typical KPI	Description/Parameter	Remarks
<b>Project Health Indicator</b>	Overall health indicator of the project, with individual indicators for scope, schedule and budget. Indicate health red, yellow, green (RYG)	<p>Project manager is also advised to report the trending information against RYG health indicators</p> <ul style="list-style-type: none"> <li>Trending up- if improving</li> <li>Trending down- if deteriorating</li> <li>Trending flat- status quo</li> </ul>
<b>Risks Indicator</b>	<ul style="list-style-type: none"> <li>Overall risk matrix comprising all open risks with impact and probability information</li> <li>Time period trend of open and closed risks giving trending/historic information</li> <li>Indicators for risks (RYG) to provide information on risk categories</li> </ul>	
<b>Defect Matrix</b>	<ul style="list-style-type: none"> <li>Defect trend/ defect matrix during execution phase giving open and trending defects with respect to <ul style="list-style-type: none"> <li>Criticality –critical, high, medium, low</li> <li>Priority</li> <li>Severity</li> </ul> </li> <li>Indicators for defects (RYG) to provide information on defect categories</li> </ul>	Project teams can have their own definition of defect categorization. However, same should be defined and baselined prior to moving to execution phase.
<b>Project Performance Score Card</b>	<p>A project performance score card related to:</p> <ul style="list-style-type: none"> <li>Product <ul style="list-style-type: none"> <li>Business value delivered</li> <li>Remaining feature backlog</li> <li>Quality</li> </ul> </li> <li>Team <ul style="list-style-type: none"> <li>Customer and team satisfaction</li> <li>Iteration/ sprint velocity variation</li> <li>Audit pass rate</li> </ul> </li> <li>Financials <ul style="list-style-type: none"> <li>Cost savings per release</li> </ul> </li> </ul>	To be provided every quarter or upon completion of development, whichever is shorter

Typical KPI	Description/Parameter	Remarks
	<ul style="list-style-type: none"> <li>○ Amount spent per release</li> <li>• Schedule               <ul style="list-style-type: none"> <li>○ Earned value</li> <li>○ Release burn down</li> <li>○ Days per release</li> </ul> </li> </ul>	
<b>Sprint Burn down Chart/Release Burn down Chart</b>	A chart showing the amount of work remaining at the end of each sprint on an on-going basis	Updated chart at the end of every sprint/ release and showing historical information on sprint/ release wise work remaining vis-a vis work planned
<b>Executive Escalation</b>	Specific action/ intervention required by executive team	

## 5. SELECTING A PROJECT MANAGEMENT FRAMEWORK

The goal of any project management framework is to achieve greater efficiency and effectiveness through consistent use of repeatable processes. Project complexity is a key indicator of the framework that will be most effective for a given project. The Stacey complexity model, visualized below, is one way to define project complexity.

When what you are going to build and how you are going to build it are both well known, a waterfall approach will typically be the most efficient. When 'what and how' are less certain, iterative approaches are more effective because each iteration increases certainty.



Source: <http://bkekst.weebly.com/bk-blog/category/agile-vs-waterfall>

The following table maps sample projects to the framework(s) most appropriate for the level of complexity typical for that type of project. It should be noted that organizations often find that settling on a common framework that aligns with their culture and the types of projects

they typically undertake is more efficient than asking project teams to regularly switch between frameworks.

Example Project	Typical Framework(s)
Upgrading networking infrastructure to support higher bandwidth	Waterfall or Kanban
Migrating individual physical servers to shared virtual infrastructure in the cloud	Hybrid or Scrum
Ongoing support, enhancement, maintenance of existing applications	Kanban
Application development for new functionality with periodic releases	Scrum, Hybrid
Modernization of an existing system to a current, but proven technology stack with minimal changes to existing functionality	Waterfall, Kanban or Hybrid
Modernization of an existing system to an emerging technology stack with significant enhancements to system functionality	Scrum, Hybrid
Integrating data from a system of record with an existing system from a different agency	Any – depending upon complexity
Implementing a Commercial Off the Shelf (COTS) solution with pure out of the box functionality	Waterfall or Kanban
Integration of third party SaaS (Software As A Service) application with on premise applications	Scrum or Hybrid

## 6. KNOWLEDGE AREAS

PMI identifies ten knowledge areas applicable to most technology projects, regardless of framework. These knowledge areas span the project lifecycle. It should be noted that while project managers have the responsibility for ensuring these knowledge areas exist within their projects, some areas may be managed by other team members in certain organizations or for certain projects.

- **Project Integration Management:** This area is unique in that accountability for this knowledge area cannot be delegated or transferred away from the project manager. The project manager is the one who has to combine the results from all knowledge areas into an overall view of the project. (Ex. Transitioning between phases)
- **Project Scope Management:** Ensures the project includes all the work required, and only the work required, to complete the project successfully. (Ex. Formal acceptance of functionality by users)
- **Project Schedule Management:** Addresses timely completion of the project. (Ex. Managing dependencies)
- **Project Cost Management:** Includes processes for planning, estimating, budgeting, financing, funding, managing and controlling costs against budget. (Ex. Estimating costs)
- **Project Quality Management:** Focuses on meeting stakeholder expectations for quality of project outputs and products. (Ex. Independent verification of products against requirements)
- **Project Resource Management:** Identification, acquisition and management of resources needed for the project. (Ex. Team building)
- **Project Communication Management:** Ensures timely and appropriate communication of project information to stakeholders. (Ex. CIO Reporting)
- **Project Risk Management:** Identifies, analyses, responds to and monitors project risks. (Ex. Identifying responses to individual risks)
- **Project Procurement Management:** Integration with the organizational processes for purchasing or acquiring products and services for the project. (Ex. Integration with RFP process)
- **Project Stakeholder Management:** Identification and engagement of people, groups or organizations that could impact or be impacted by the project. (Ex. Identifying citizen groups impacted by a project)

## 7. INDEPENDENT VERIFICATION & VALIDATION (IV&V)

Independent Verification and Validation (IV&V) is a quality control process that looks at both the performance of the project and the quality of the resulting products. IEEE describes verification and validation as follows:

Verification	Validation
<i>Are we building the products right?</i>	<i>Are we building the right products?</i>

Independence is central to IV&V. As such, IV&V services must be performed by an individual or organization that is independent of the organization involved in delivery of the project.

The Office of Chief Information Officer has established an Enterprise wide IV &V policy [Policy Number CIO-103](#). This policy document is available as Appendix 2.3 to this document and identifies specific services levels for certain categories of projects.

IV&V is in addition to, NOT a replacement for, quality management activities within the project team.



## APPENDIX 1: TYPICAL ROLES AND RESPONSIBILITIES

1) **Chief Information Officer** – As defined in KRS 42.730 (See Appendix 2.2)

### 2) **Executive Director, Office of Project Management**

Executive Director, Office of Project Management reports directly to the CIO or their designee. The Executive Director shall be the administrative manager for OPM and is responsible for:

- Developing an OPM Center of Excellence including best practice, standards, processes and tools
- Providing project management education and training for project management professionals across the Commonwealth
- Overseeing project reporting to the Executive Branch, particularly to the CIO

### 3) **Project Sponsor**

An Executive Director or any other Officer appointed by the Executive Cabinet responsible for authorizing a project. The project sponsor typically:

- Ensures that the business need is valid and correctly prioritized
- Ensures that the project is properly launched
- Ensures that the project remains a viable business proposition
- Ensures changes to the project are properly managed
- Ensures risks are managed
- Establishes the project organization, roles and reporting structure
- Ensures the project is under control
- Approves key project deliverables
- Initiates project reviews and supporting the process of review
- Resolves issues that are beyond the control of the Project Manager
- Resolves conflict and removes obstacles to progress
- Is responsible for overall budget, schedule, scope and quality of the project

### 4) **Technology Advisory Council (TAC)**

The Technology Advisory Council (TAC) functions as the primary governance body for information technology in the Executive Branch of Kentucky state government. The TAC advises the State CIO on implementation and management of strategic IT initiatives that maximize business value in support of service delivery while protecting the data and network resources that allow state government to operate.

Members of the council represent business, IT, or financial management leadership from each cabinet in the Executive Branch.

The TAC is chaired by the Chief Information Officer, Commonwealth Office of Technology.

## 5) Steering Committee

The CIO shall head the Steering Committee. However, CIO may delegate this function to any other officer at his/her sole discretion. The Steering Committee typically consists of stakeholders such as the

- CIO
- Project sponsor
- Executive director, branch manager(s) and/or technology leaders from the sponsoring agency and key partner agencies
- Subject Matter Experts (SMEs)

The Steering Committee's role is to provide advice, ensure delivery of the project outputs and the achievement of project outcomes. This may include such tasks as:

- Advising the project sponsor
- Providing input to the development of the project, including the evaluation strategy
- Providing advice on the budget
- Defining and helping to achieve the project outcomes
- Identifying the priorities in the project – where the most energy should be directed
- Identifying potential risks
- Monitoring risks
- Monitoring timelines
- Monitoring the quality of the project throughout the project lifecycle
- Providing advice (and sometimes making decisions) about changes to the project throughout the project lifecycle

## 6) Project/Program Manager




- Responsible and accountable for the outcome of the project
- Develops, manages and controls project resources, scope, cost/budget, schedule, communication, quality, risks and dependencies
- Defines project roles and responsibilities
- Manages reporting to various stakeholders such as the project team, steering committee, CIO, etc.
- Leads project risk management
- Promotes appropriate involvement of all stakeholders
- Coordinates escalations to resolve issues and roadblocks
- Enforces effective change control
- Mentors team members
- Applies project management best practices, standards, processes, etc. applicable to the project

## **7) Branch Manager/Functional Manager**

The branch manager or functional manager of a department providing resources to a project is responsible for:

- Allocating resources as needed per project schedules
- Collaborating with the project sponsor, project manager, steering committee, etc., as necessary, in order to support successful completion of the project
- May be responsible for managing project resources, including sharing information relevant to project financials, schedule, issues, risks, etc.
- May serve as a subject matter expert

**APPENDIX 2: REFERENCES**

Document	Details
<b>2.1 HB 244</b>	 HB244.pdf
<b>2.2 KRS 42.730 (Roles and Responsibilities of CIO)</b>	 KRS 42.730.pdf
<b>2.3 CIO-103 (IV&amp;V Policy)</b>	 CIO-103 Independent Verific